



Growing & Planting Underwater Bay Grasses



*Presentation developed by
Jill Bieri, and modified by
Peter Bergstrom, NOAA, for 2006
"NOAA Restoration Day"*

What are Underwater Grasses?

- Rooted, flowering plants; produce seeds
- Grow completely submerged in shallow water of Bay and tributaries
- A.K.A.: SAV, seagrass
- NOT: seaweed, algae

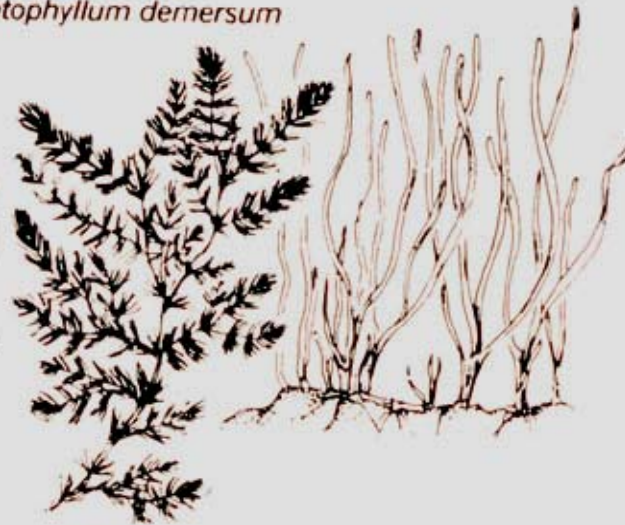


WIDGEON GRASS
Ruppia maritima

EELGRASS
Zostera marina

HORNED PONDWEED
Zannichellia palustris

COONTAIL
Ceratophyllum demersum



WILD CELERY
Vallisneria americana

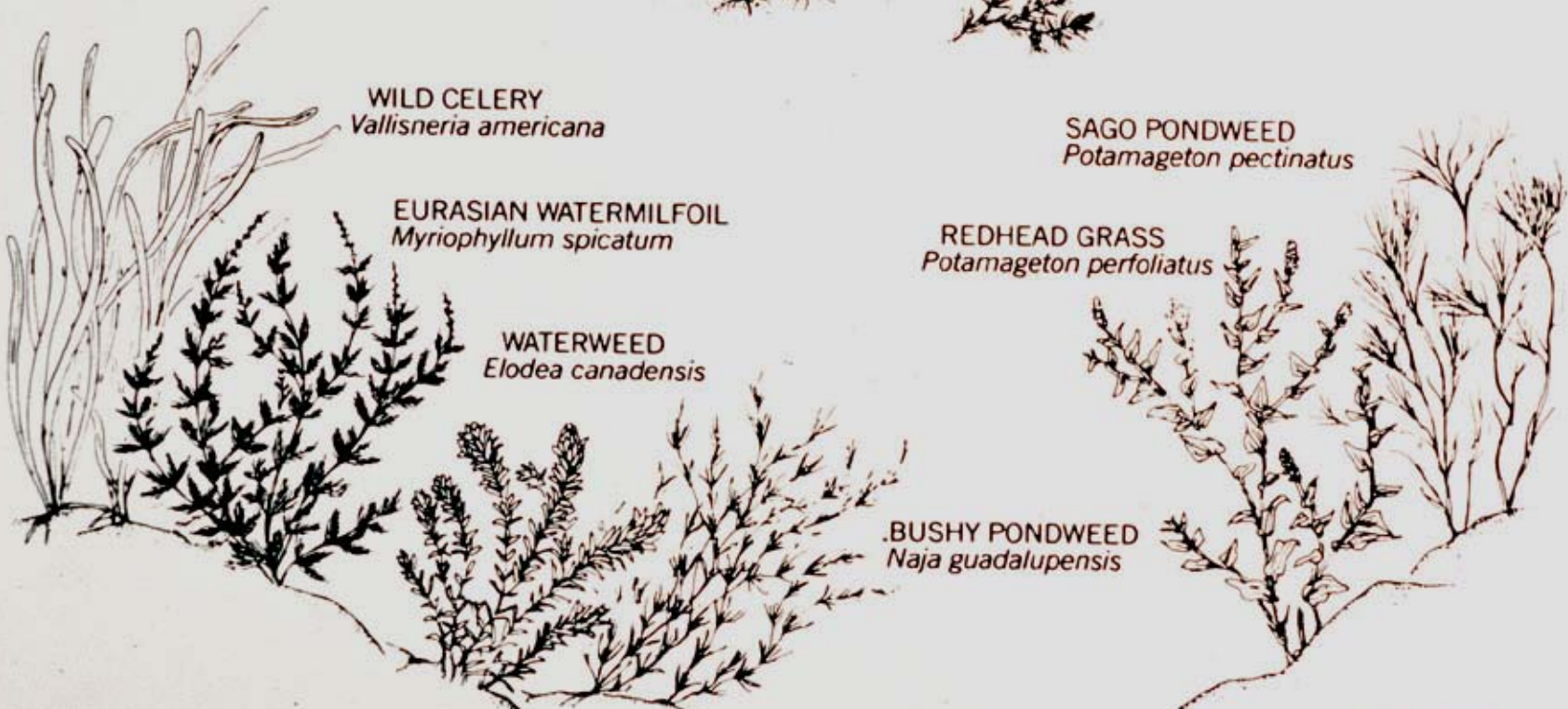
SAGO PONDWEED
Potamogeton pectinatus

EURASIAN WATERMILFOIL
Myriophyllum spicatum

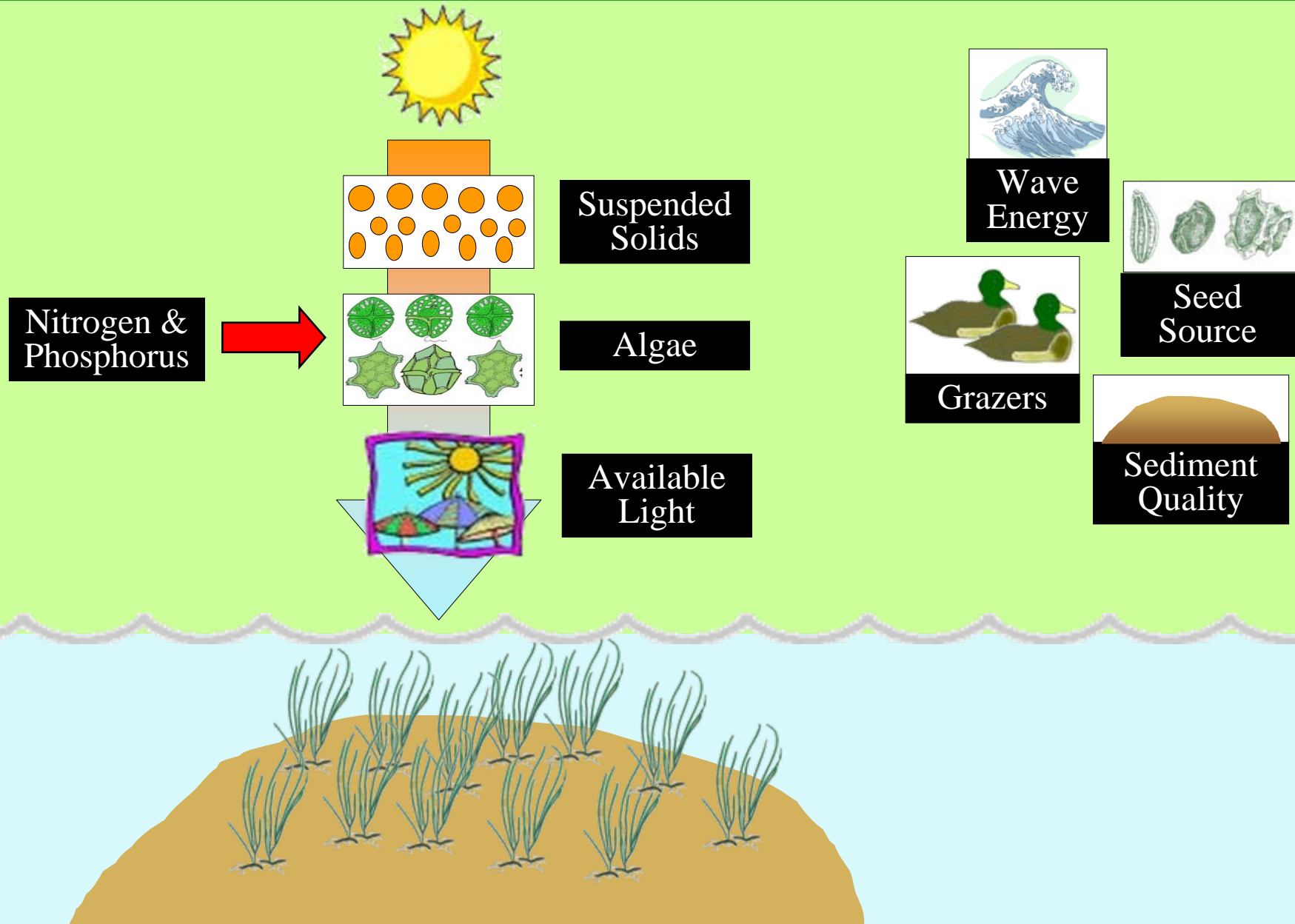
WATERWEED
Elodea canadensis

REDHEAD GRASS
Potamogeton perfoliatus

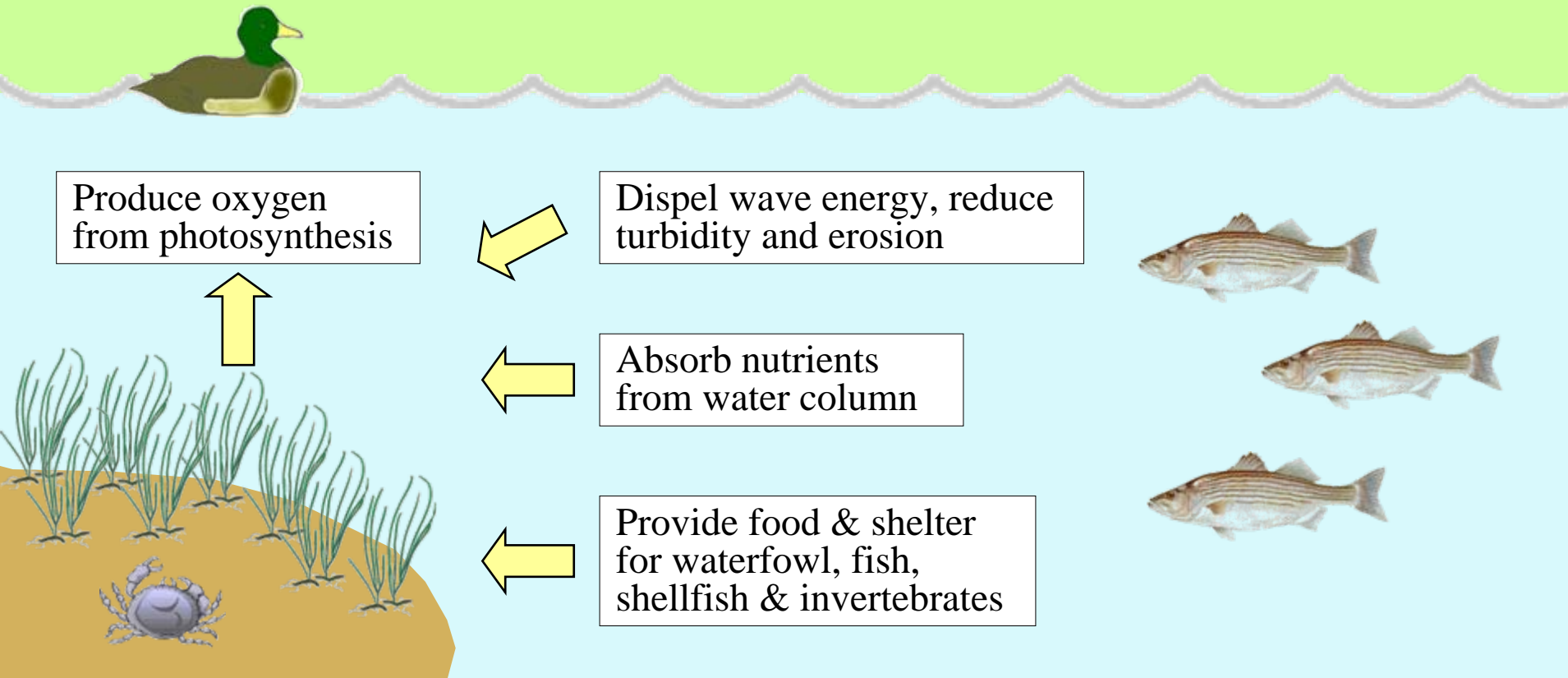
BUSHY PONDWEED
Najas guadalupensis



What Affects SAV?

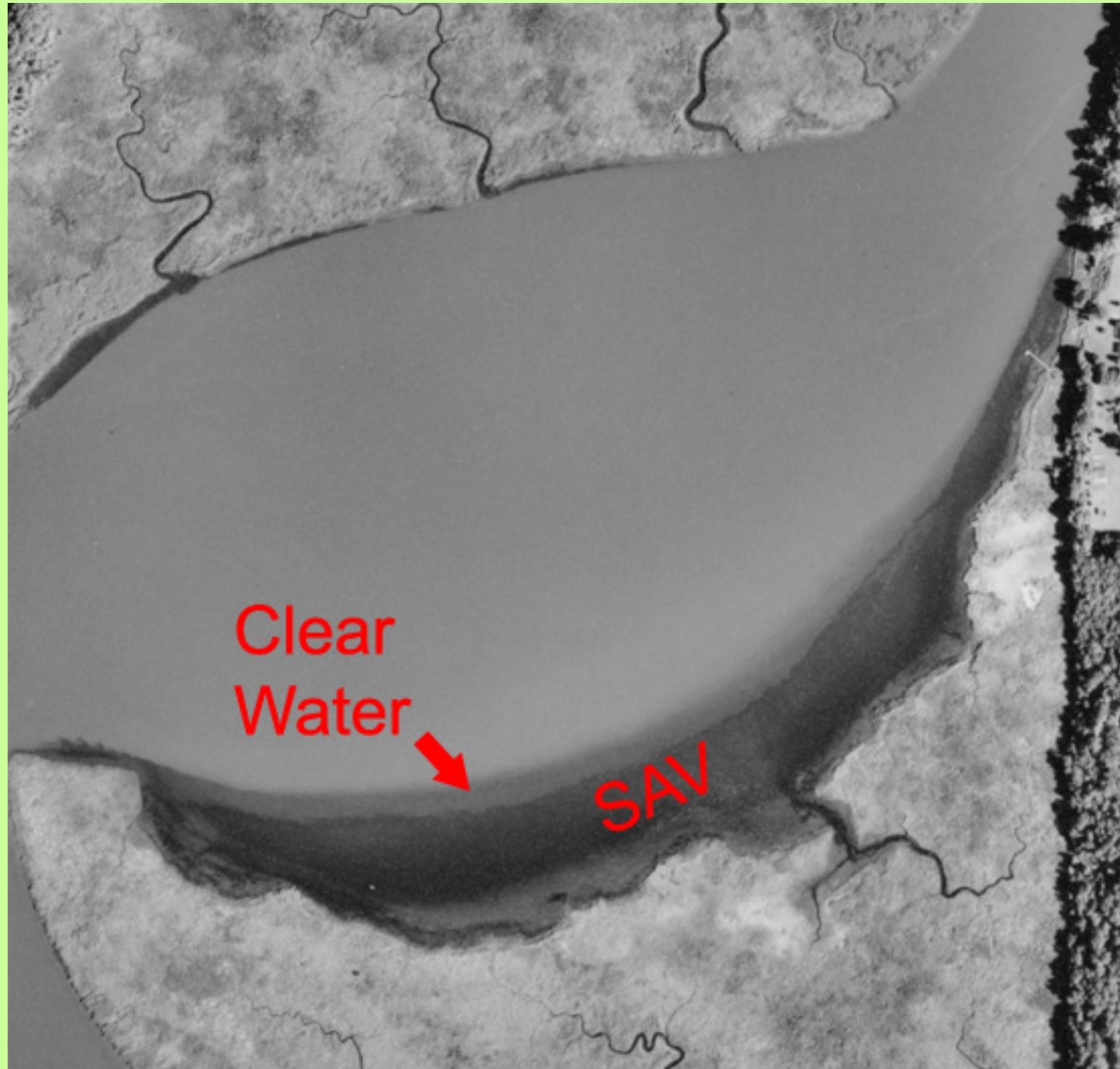


SAV: Ecological Role

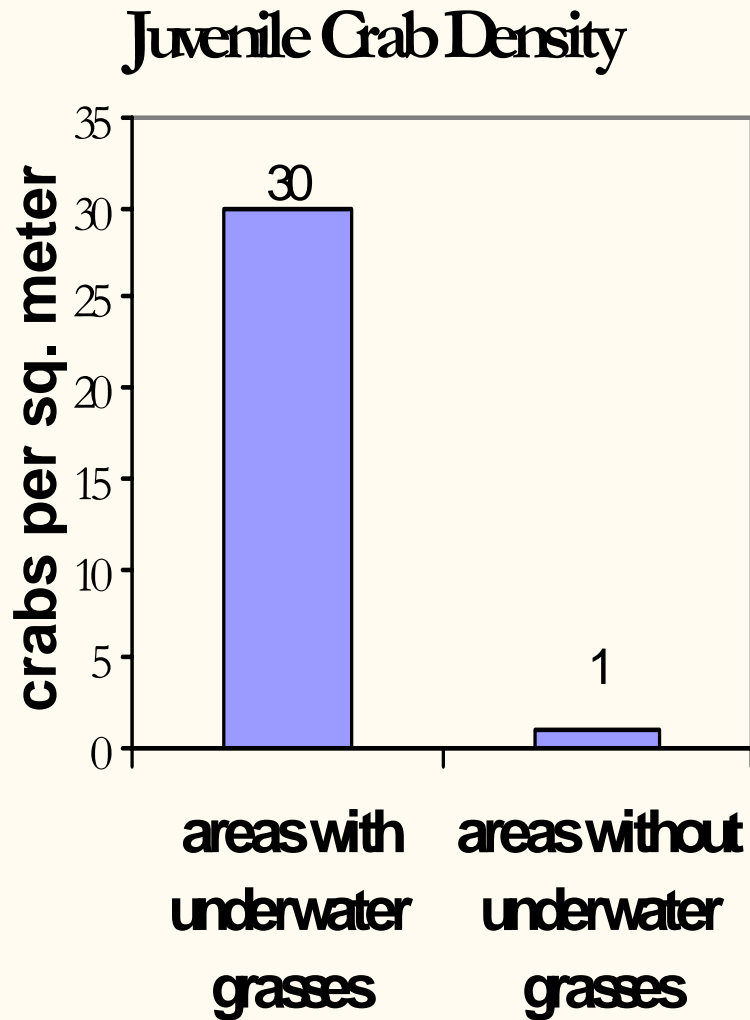


As underwater grasses naturally die-off, their decomposing matter helps form a critical food chain in bay sediment.

Underwater Grasses Help Clean the Bay!



**Are blue crab
populations and
underwater grass
abundance related?**



SAV species planted in NOAA Restoration Days

- Wild celery (planted at Otter Point Creek)
- **Redhead grass** (planted at CBEC and Webster Field, will plant at Trent Hall)
- Sago pondweed (planted at CBEC and Webster Field)
- **Widgeon grass** (not planted before, will plant at Trent Hall)

Wild Celery (*Vallisneria americana*)



- long, flat ribbon-like leaves
- Found primarily in fresh to slightly brackish water (best growth at 5 ppt or less)
 - *Planted at Otter Point Creek during first NOAA Restoration Day*
 - *Water at Trent Hall is too salty for it, will NOT grow this year*
 - *Planting it on the Magothy for the first time this year*
- excellent waterfowl food

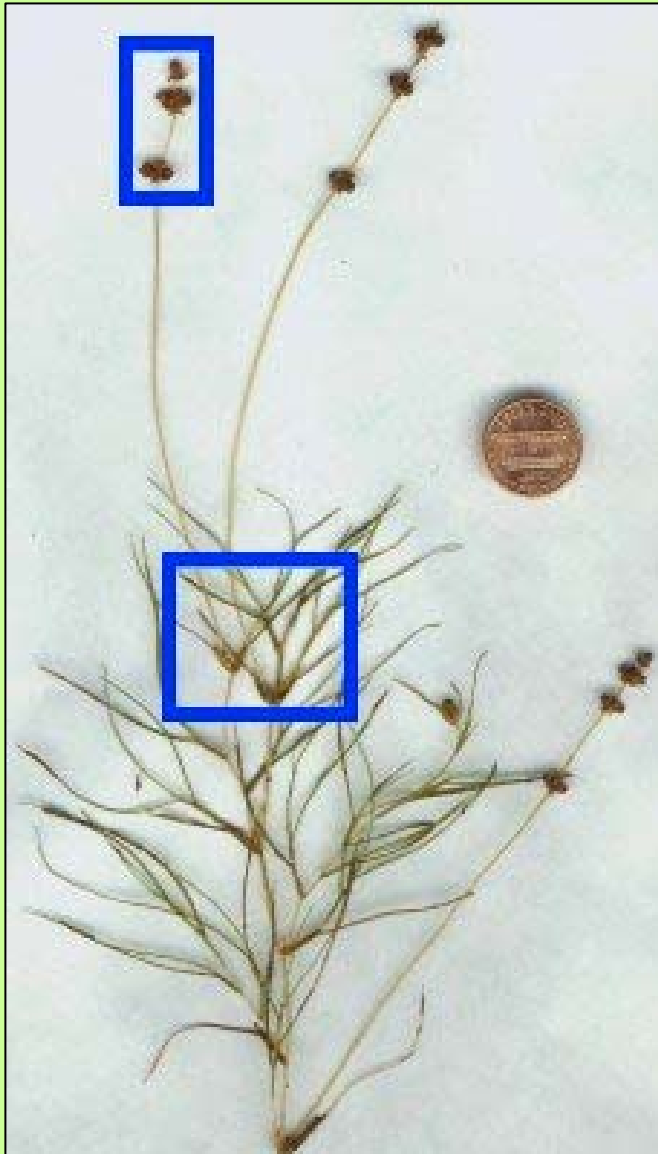
Redhead Grass (*Potamogeton perfoliatus*)



- straight stems and rounded leaves that clasp stem at base
- found in moderately brackish water (5-15 ppt)
 - *Some survival after planting at CBEC in 2004, not at Webster*
 - *Could grow at Trent Hall, so we will grow it this year*
- named for redhead duck
- excellent waterfowl food



Sago pondweed (*Stuckenia pectinata*)



- Thin, bushy leaves with terminal seed clusters
- found in moderately brackish water (5-25 ppt)
 - *Could grow at Trent Hall, but I have never had success planting it, so we will NOT grow it this year*
- excellent waterfowl food



Widgeon grass (*Ruppia maritima*)



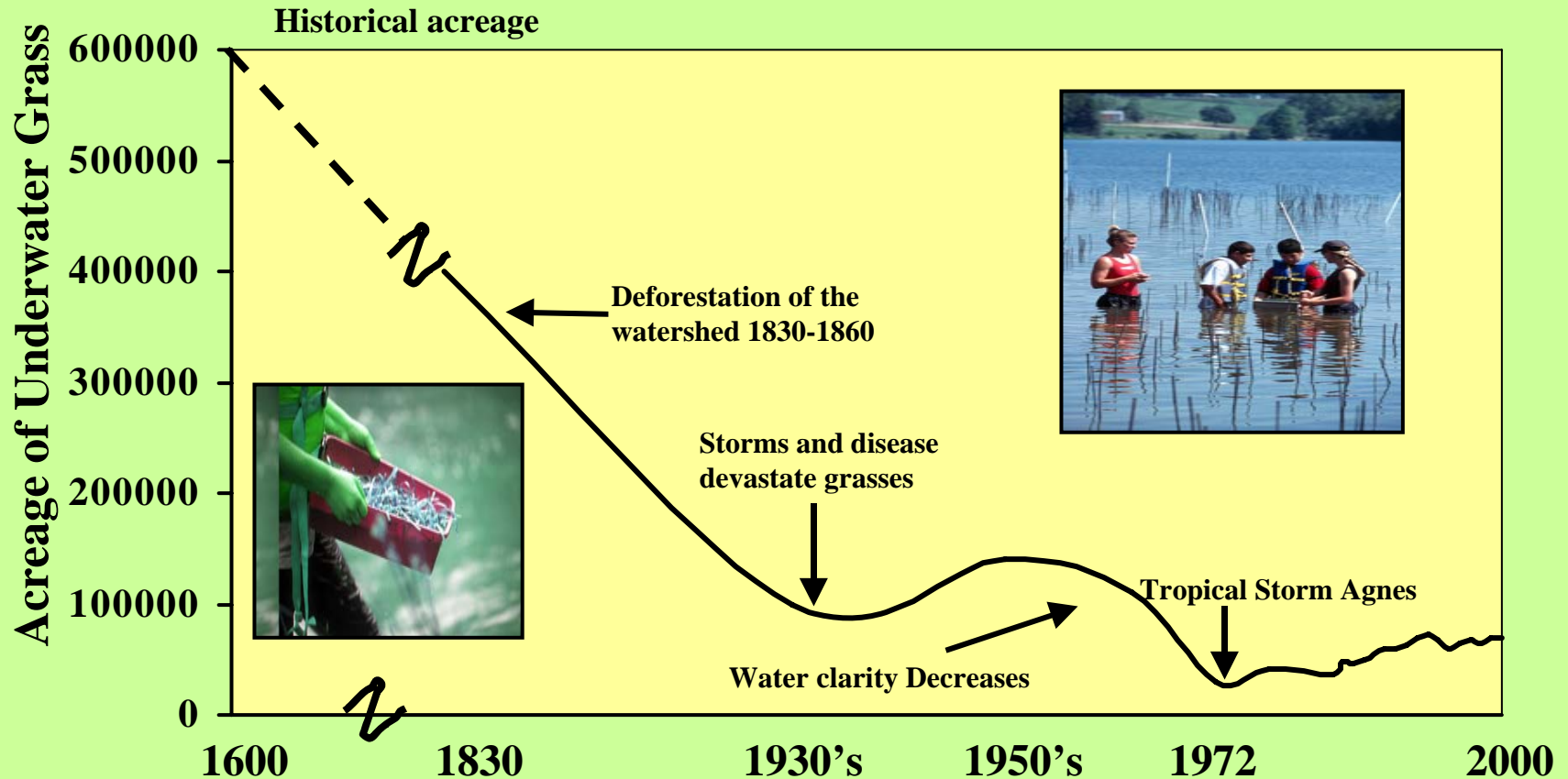
- Thin, branching leaves with terminal seed fans
- found in moderately brackish to hypersaline waters (5-50 ppt)
 - *Could grow at Trent Hall, and has been found nearby, so we will grow it this year*
- excellent waterfowl food



Why are we planting SAV?

- To help “jump start” natural recovery, especially where there are few sources of seeds or shoots nearby
- To enhance species diversity, to try to increase resilience and habitat value
- To learn how to do it better
- To make more people aware of this valuable fisheries habitat

Decline of Underwater Grasses



Chesapeake Bay has only 12% of historical acreage of underwater grasses. Poor water quality caused by nutrient and sediment pollution is the culprit.

Source: CBF (abundances estimated)

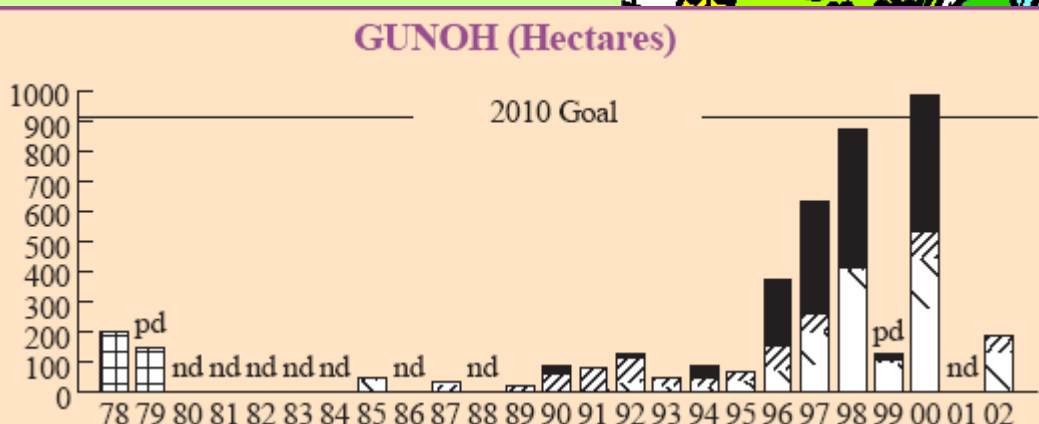
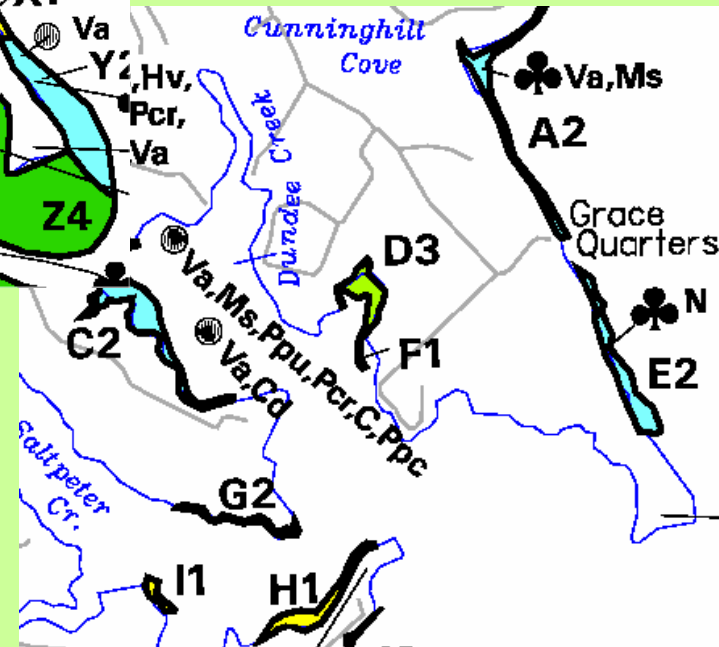
Case studies – changes in SAV area

- Tangier Sound
 - changes in flow & nutrients
- Dundee Creek
 - changes in flow & salinity
- Magothy & Severn Rivers
 - episodic events seemed to cause changes, mahogany tide 2000 (decline) & mussel explosion 2004 (increase)
- Susquehanna Flats
 - Big increase in bed density & presence of wild celery, 2004-2005, not sure of causes

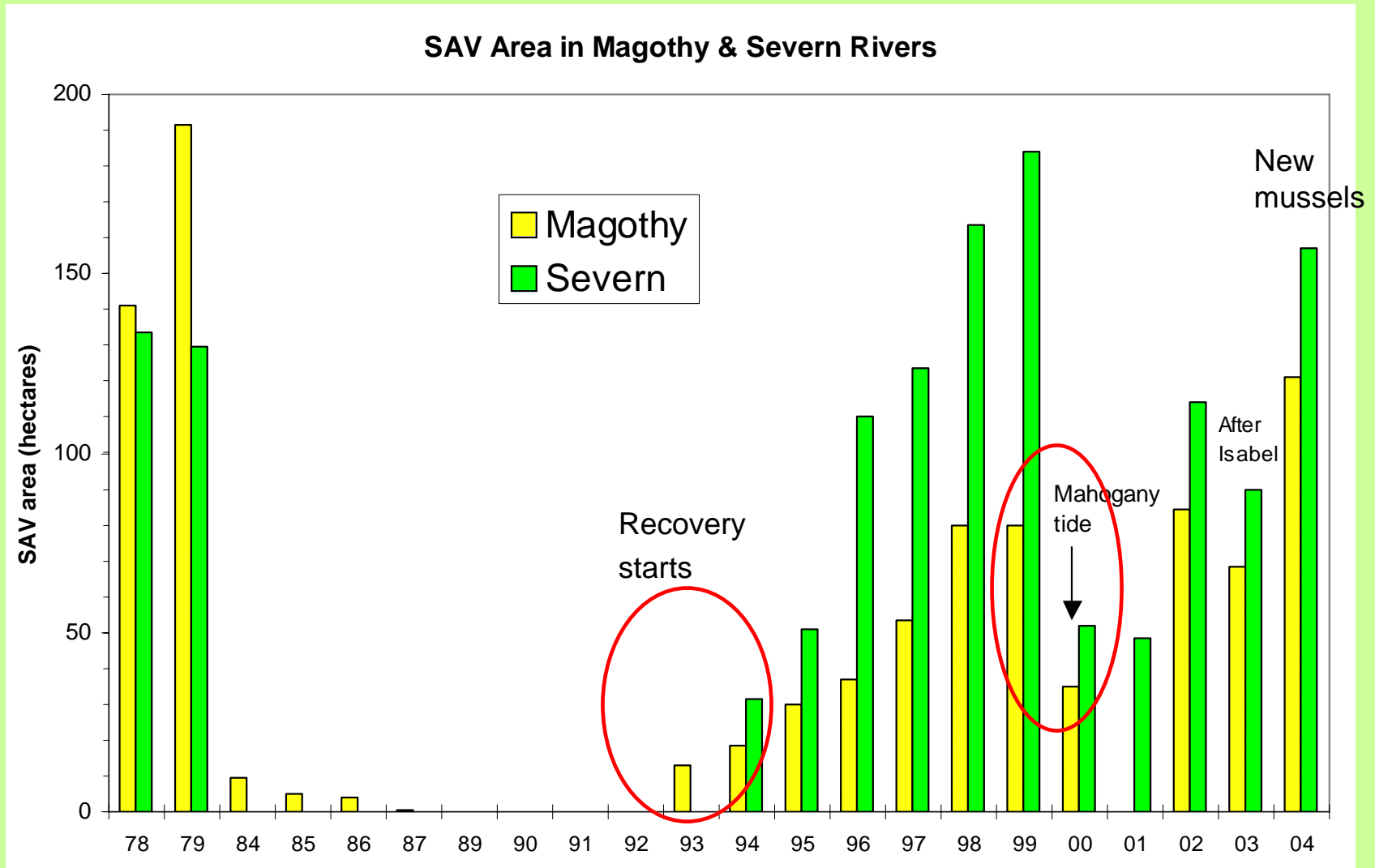
1994

2000

2002



SAV area in Magothy & Severn, 78-04



Susquehanna Flats recovery



Dense, diverse beds, 9-23-05

[illegible]

Rise & fall of SAV: Conclusions

- SAV abundance is dynamic in Chesapeake Bay
- Causes of its rise and fall are not always clear
- *Thus, to ensure persistence, we need a variety of species growing in numerous locations*
- Planting SAV helps to accomplish persistence



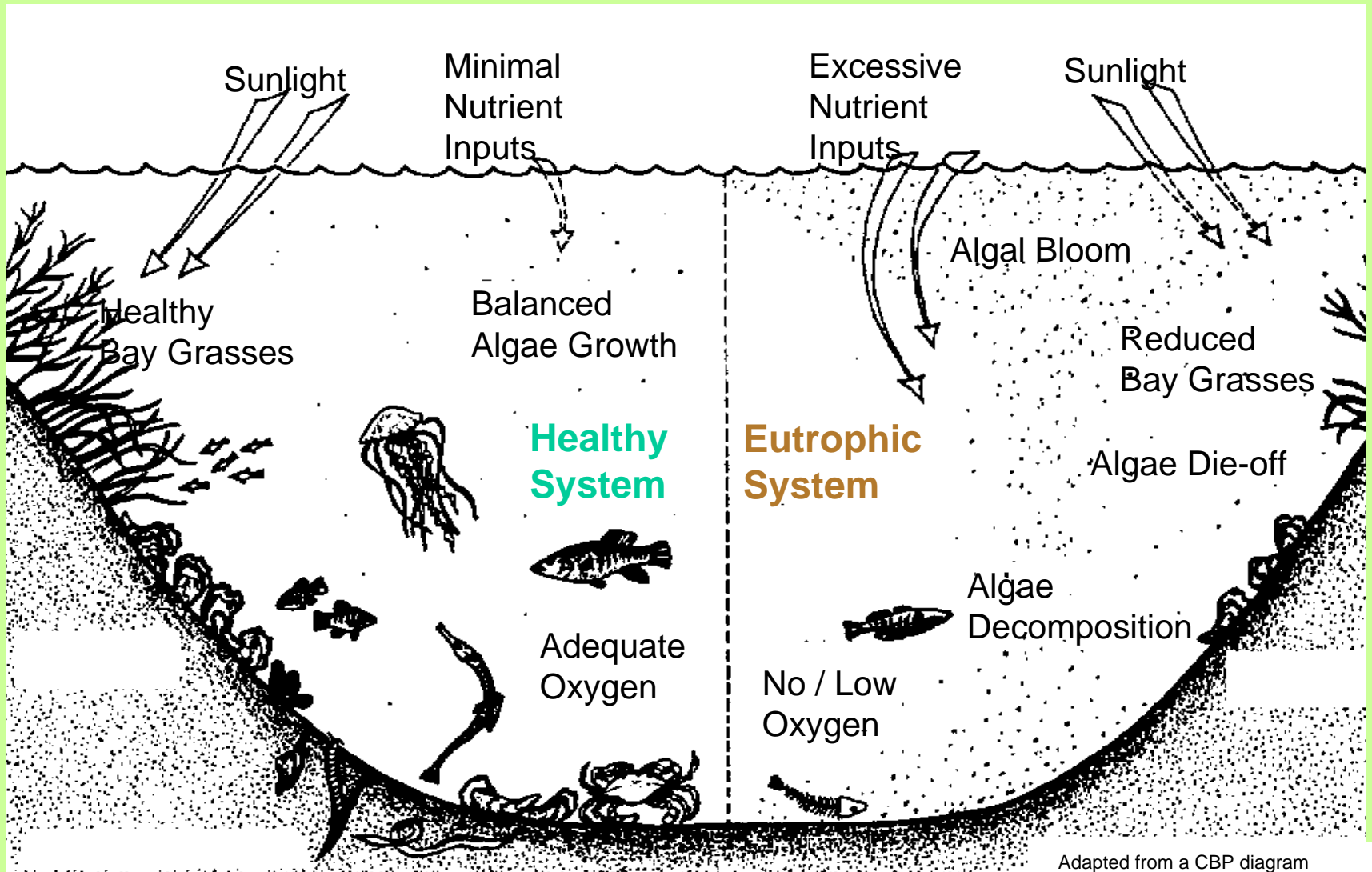
Goal: 185,000 acres by 2010

Accomplished by:

- Improving Water Quality
(reducing inputs of
nitrogen and sediment)
- Protecting Existing Beds
(education, dredging
issues, mute swan control)
- Restoring grass beds
(establish founder
populations)



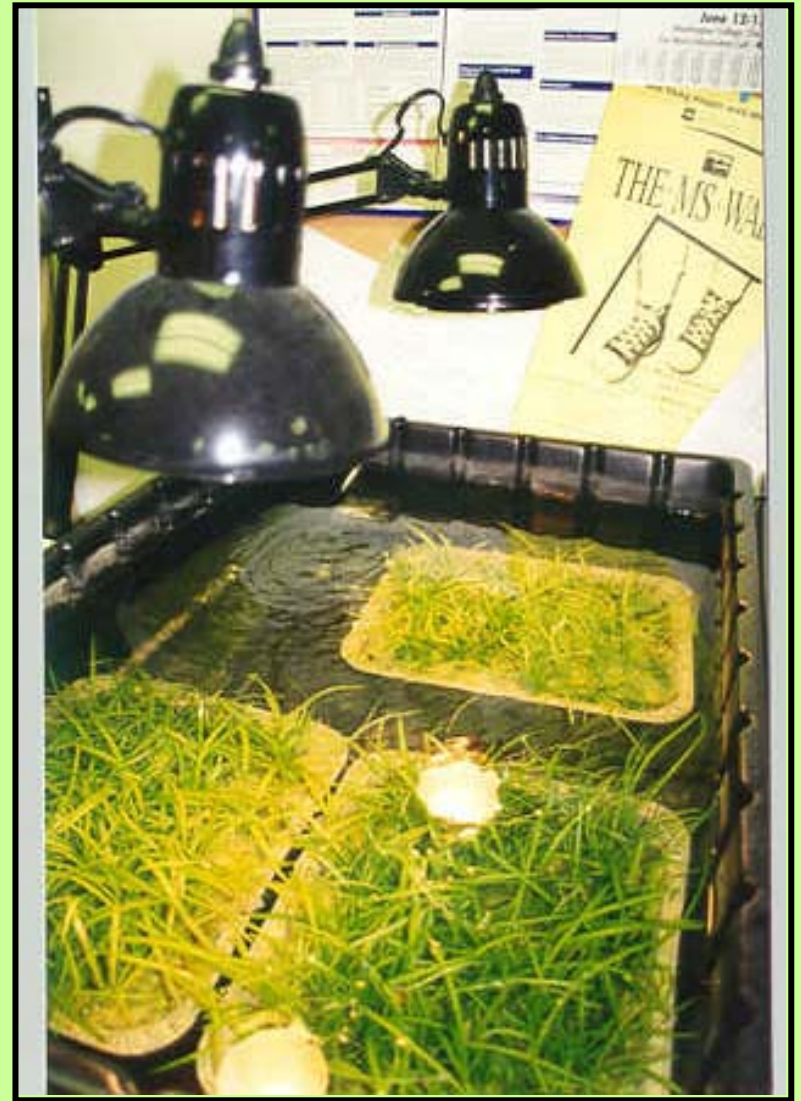
Which Bay do we want?



NOAA Grasses

Timeline 2006

- **March 23: Workshop; Plant in systems**
- **March-June: Grow-out**
- **June 13: Plant at Trent Hall**
- **June-October: Monitoring**





Planting day 2004 (CBEC)



NOAA Grasses

Results CBEC (2004)

- Percent cover at planting (6/04) was about 50% (25% each species)
- CBEC staff checked them on a clear-water day, 9/26/04
 - Redhead had expanded from 25% to 65% of the fenced area, but sago pondweed had shrunk to only 5% cover*
- Only a few very small redhead plants were found in 2005; fences were lost over winter



Redhead grass a week after planting, CBEC

Planting day 2005 (Webster)



Webster SAV results (2005)

- Planted
redhead &
sago 6/14/05,
not fenced
(few
waterfowl)
- All gone by
7/29/05
- Think they
were
smothered by
*drifting rafts of
widgeon grass*



2006 planting location, Trent Hall



Trent Hall planting location

(off crescent beach between breakwaters & tombolos)

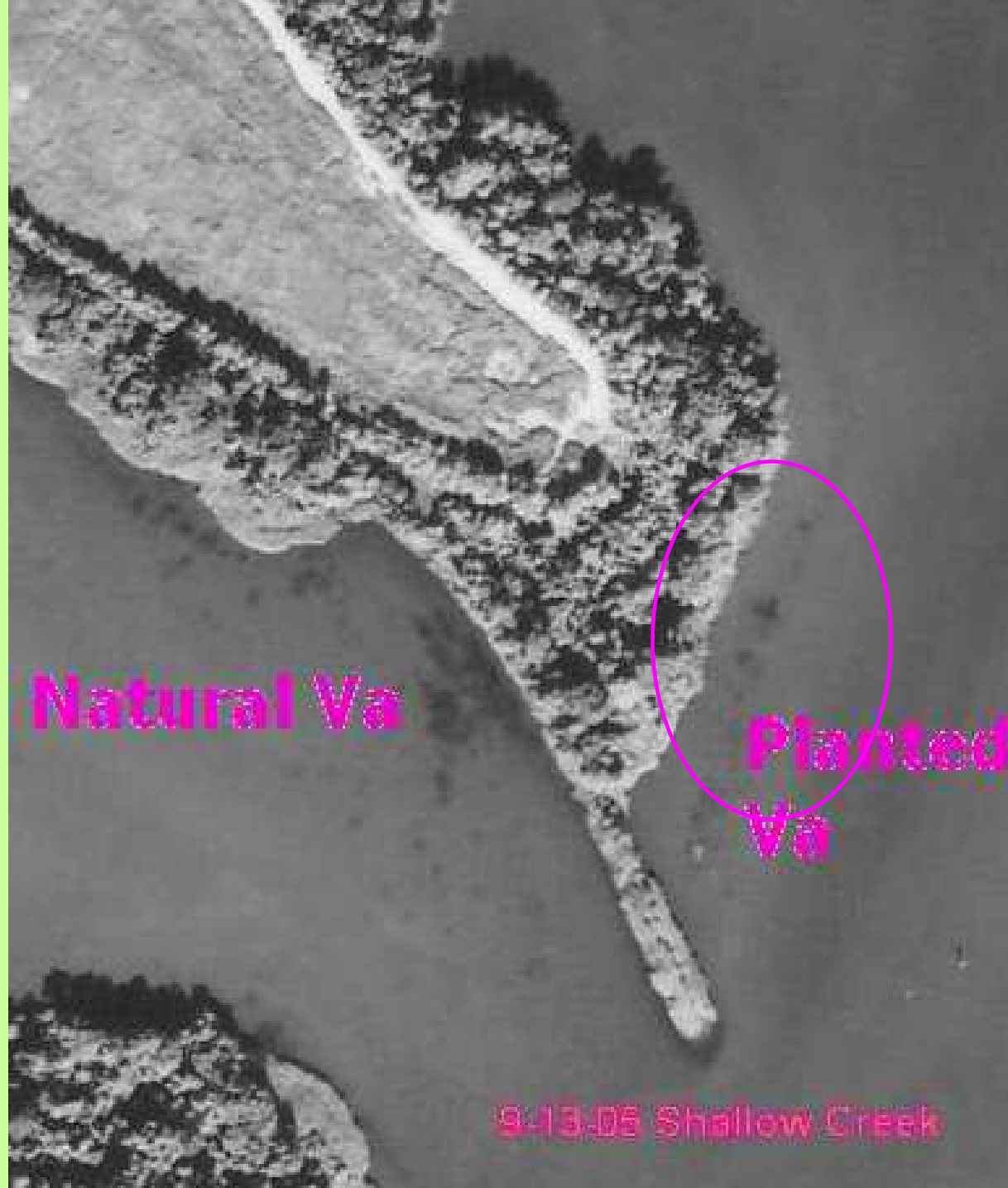


Other SAV planting success

- Shallow Creek, mouth of Patapsco
 - Redhead grass, sago pondweed, and wild celery planted 1999-2001
- Sylvan View, Magothy
 - Redhead grass planted 2004 & 2005
- Breton Bay, lower Potomac
 - Redhead grass planted 2004

Shallow Creek, Patapsco

(2000 plants in 2005;
only wild celery
survived, was already
growing elsewhere in
creek, natural beds
have expanded since
2000 as well)



Sylvan View,
Magothy
(2004 planted
redhead grass seen in
June 2005)



Sylvan View, Magothy

(Same 2004 plants in Sept. 2005 aerial photo)



Breton Bay 2004 planting



Redhead grass right after planting

Breton
Bay,
Potomac
(2004
planted
redhead
grass, in
2005)

Breton Bay, photo taken 6/05

Rest of SAV is widgeongrass

McAllister Ppf planting, 6/04



Our goal: SAV
Success!

